

Consortium for Electric Reliability Technology Solutions

Paper on

Scoping Study of Electricity Market Databases

Prepared for

Transmission Reliability,
Distributed Energy and Electricity Reliability Program
Assistant Secretary for Energy Efficiency and Renewable Energy
U.S. Department of Energy

Principal Authors

Emily S. Bartholomew, Kristina Hamachi LaCommare, Afzal S. Siddiqui, and Chris Marnay
Lawrence Berkeley National Laboratory

October 2002

The work described in this study was coordinated by the Consortium for Electric Reliability Technology Solutions on behalf of the Office of the Assistant Secretary for Energy Efficiency and Renewable Energy, Transmission Reliability, Distributed Energy and Electricity Reliability Program of the U.S. Department of Energy under Contract No. DE-AC03-76SF00098.

I. Introduction

This study summarizes the results from a brief assessment of four different sources of electricity market data: market results from the various U.S. Independent System Operator (ISO) markets, commercially available databases in the U.S., international ISO markets, and the capabilities of Genscape's commercially available Power 2.1.

The first part of this work looks at the various U.S. ISO markets to determine the extent of data availability and comprehensiveness. Over the last three years, Berkeley Lab has built a database of market outcomes in the California and New York Independent System Operator (CAISO & NYISO) markets, as well as in the defunct California Power Exchange (CalPX). California data was accumulated from the opening of California's markets until the collapse of the state's restructuring at the end of 2000. Beginning in the spring of 2002, data has been collected for the NYISO, and has now been accumulated for the entire period of its markets. Both of these data sets are fully functional and accessible on the web at <http://electricitymarketdata.lbl.gov>. This section summarizes California and New York ISO's data accessibility and what has been learned about the remaining U.S. ISO's. The most likely next addition to Berkeley Lab's website is the rather limited Electric Reliability Council of Texas (ERCOT) data sets.

The second part of this study assesses commercially available U.S. market databases. The goal was to determine the abundance and comprehensiveness of such databases and whether they offer anything substantially different from the publicly available sources. A number of databases were discovered by an internet-based search.

The third portion of this review scopes out some international electricity markets. This survey of the market data helps determine how similar or dissimilar the U.S. market data dissemination policies are in other countries.

The fourth and final part of this work details a commercially available product by Genscape Inc. called Power 2.1. Power 2.1 monitors over 200 power plants across the U.S. in real-time through a Graphical User Interface that is accessible via an online internet browser. This product is assessed for its electricity market data.

II. U.S. ISO Market Data Assessment

New York ISO (NYISO):

The New York ISO is a non-profit organization which operates a wholesale energy market open to all market participants, and is responsible for scheduling electricity generation and transmission for the entire state of New York. The NYISO OASIS website publishes a variety of data, which is summarized in the chart below. Most of these datasets are available after the daily close of the market. For example, the Day Ahead LBMP data is posted 6 hours after the close of the day ahead market, at approximately 11 a.m. All real time market data, on the other hand, is published every five minutes, and is graphed in real time on the LBNL Energy Crisis website (<http://energycrisis.lbl.gov/ny>).

Data	Settlement Period/ Data Published	Location
Locational Based Marginal Price (LBMP)	Day Ahead Hour Ahead Real Time	Zones Generators Reference Bus
Loads	Forecast (7-day) Zonal bid Real Time	Zones (LI and NYC together)
Ancillary Services <ul style="list-style-type: none"> • 10 min spin, • 10 min non-spin, • 30 min operating reserve • Regulation 	Day Ahead Hour Ahead	East West
Total Transmission Capacity/Actual Transmission Capacity	Day Ahead Hour Ahead	Interfaces
Tie Line Flows	hourly actual	Export Interfaces (PJM, OH, NPX, HQ)

NYISO also publishes bid information monthly, with a 6-month lag. This is for load, generation, transaction, unit commitment parameters, transmission congestion contracts and installed capacity. This data is published with masked source, sink and location id-numbers that remain consistent, so it is possible to track the bids of a specific, however unknown, unit or participant.

Results of its transmission congestion contract (TCC) auctions are also published, TCCs cover 6-month, 1-year, and 2-year time periods. TCCs can be held between any two buses on the transmission system.

Also published on the OASIS site is a record of operational announcements and emergency events.

All data mentioned above can be downloaded from the NYISO OASIS site in .csv format, either by month or by day. Most data is available from November, 1999, except for the reference bus LBMP, which is available from May, 2001, and some load data which are available from June, 2001.

NYISO also publishes a day ahead energy report that includes hourly total (not zonal) load bids and price capped load bids that were bid into and accepted in the day ahead market. However, the load cannot be matched directly with a market price, because each load zone pays its own LBMP, and the NYISO does not publish separate load bids for each zone.

California ISO (CAISO):

The California ISO is also a non-profit entity, responsible for ensuring the reliability for the majority of the California electric system. It is currently in the process of re-designing the market structure.

Officially, it publishes the following:

- ex-post market prices,
- 10 minute price information, including inc and dec supplemental energy prices,
- forecast loads and imbalance energy requirement,
- actual and scheduled forecasts,
- congestion zone reference price,
- zonal congestion price difference ,
- available transmission capacity,
- branch group congestion settlements (which indicate congestion on transmission lines), and
- zonal congestion price differences.

The CAISO also publishes public bid data with a 180-day lag for the congestion, ancillary service and imbalance energy markets.

Information on Financial Transmission Right (FTR) owners is available, including the dates of ownership, the from- and to- locations, and the price of the FTR.

All data can be accessed somewhere on the CAISO OASIS website and downloaded in .xml or .csv format. However, because the CAISO markets interpretation of these data sets is very confusing makes them far from transparent, with many of the interesting transactions taking place outside of CAISO markets.

Electric Reliability Council of Texas (ERCOT):

ERCOT is a corporation that is in charge of administering the electric system for the majority of Texas. It is not under the jurisdiction of the Federal Energy Regulatory Commission (FERC). ERCOT publishes the current system profile data, including demand, generation, and tie-line flows, in real-time. It also provides an archive for the following: ancillary service requirements, bid stacks, and reserve deployment, inter-zonal congestion costs, actual and forecasted daily load profiles, scheduled zonal generation, and emergency notes. This data can all be downloaded as excel documents.

Market clearing prices and deployment quantities are published for the ancillary services, balancing services, and replacements services markets. The price data are only available for an eight-day window of time, except for the balancing services prices, which are only posted for four days. These are not easily available for download. Historic quantity data are available for download.

The percent of congestion on Commercially Significant Constraint (CSC) lines and total transfer capacity are published for eight-day time period. These are also not easily available for download.

Some summary data is available about the outcome of Transmission Congestion Rights auctions. These include total number of TCRs available and awarded, the market-clearing price, the number of awardees and the auction revenue for the four Commercial Significant Constraint. Individual bids or awards are not published.

PJM Interconnection, LLC:

According to its website, PJM Interconnection “operates the largest wholesale electric market in the world.” It is responsible for the reliability of the electrical system in portions of Pennsylvania, New Jersey, Maryland and Delaware. PJM publishes operational data on a real-time basis, including Locational Marginal Prices (LMP) for zones, aggregate areas, hubs, import/export interfaces, and 500kV buses, actual interface flow and transfer limits, system load and dispatch rates. PJM also maintains an archive of market data, which includes daily real time (integrated hourly) and day ahead LMP, daily operating reserve rate, hourly actual loads, daily and monthly unforced capacity market clearing results, and monthly bids into and results of financial transmission rights (FTR) auctions. PJM also publishes energy market bids after a year lag. The names of market participants are disguised.

Midwest ISO (MISO):

The Midwest ISO (MISO) is a non-profit organization which manages the electrical transmission system for portions of several mid-west states. It is responsible for reliability and for operating an open bulk transmission system. The MISO publishes point-to-point transmission rates and ancillary service prices, which are not market-based. The MISO website also offers a search tool to access current and historic information about planned and emergency outage.

The MISO operates an OASIS site, but access to this site is restricted to market participants only.

New England ISO:

The New England ISO (ISO-NE) was founded in 1997 as a not-for-profit private corporation that is responsible for maintaining the bulk electricity system in New England and, since 1999, administers the regional wholesale electricity market. The ISO-NE publishes a variety of data on its website. These data include hourly forecast and actual demand, real-time actual system demand, forecast and actual market clearing price, forecast and actual operating reserve demand and actual operating reserve clearing price, and import/exports. It also publishes energy and reserve/AGC bid data with a six-month lag.

ISO-NE publishes a hourly and daily congestion reports for the twelve congestion areas, which include unmitigated and mitigated cost of transmission congestion, and the average and marginal uplift cost.

III. Commercial U.S. Electricity Market Data Assessment

This section summarizes the findings from an internet search of commercialized electricity market databases in the U.S. While there are several commercial services, it is important to note that none of the commercial sources that were analyzed offered any information on ancillary service prices or congestion-related prices. Most of the services offer comprehensive coverage of significant market prices, e.g. volume weighted trades at certain hubs. None offers comprehensive archival data from specific markets. Below is a brief description of some of the more comprehensive data sources that were found.

Bloomberg:

Bloomberg L.P. specializes in providing data, analysis, news, trading and financial information. The Bloomberg PowerLines (<http://www.bloomberg.com>) daily newsletter has been available since September 1998. This newsletter is available as a database that covers U.S. (as well as European) energy transactions. The data include day-ahead, spot, on-peak, and forward and futures electricity prices. Day-ahead electricity prices are collected for all regions of the U.S. - West Coast, Gulf Coast, Mid-Continent, and East Coast. Volume weighted average price indexes of the western U.S. spot power prices are also assessed based on trades made through Bloomberg PowerWatch. Monthly, quarterly, and yearly forward or futures blocks of electricity prices are collected at the most actively traded hubs in the U.S. Energy futures data are collected from the New York Mercantile Exchange Energy Futures Trading Monitor. Bloomberg also offers electric utility outage information and provides current and historical information on nuclear outages in the U.S. Cost information was not readily available for this study.

DTN & Btu:

DTN and Btu are separate companies but work together in offering energy market data. DTN Energy (<http://www.dtnenergy.com>) provides a suite of online energy data via the dtnMarketWire. DTN specializes in supplier- and marketer-side data and information, but also offers retailer information. Information offered includes spot market prices and analysis, NYMEX futures prices, supplier rack prices, and weather forecasts with heating/cooling-degree days. The Btu's Daily Power Report (<http://www.Btu.net>) offers spot electricity prices for main hubs across the U.S. as well as futures prices with a comparison of the spot vs. NYMEX futures price. Nuclear power outages are also listed. Off-peak pricing information is reported in addition to weather information. A 6-10 day forecast of temperature and precipitation is summarized for major cities across the U.S. with heating degree-day information. The data is available in spreadsheet format with historical data going as far back as 1991. For the power market, daily spot prices and weekly indexed prices are available since 1996, spark spreads are available since 1997, with nuclear power plant outage data by region since 1998. For natural gas, daily spot prices are available since 1991. The price for the historical daily power data is \$1000 for a single user and \$1500 for single user natural gas data. Monthly or yearly updates are available from \$600-750 for each of the databases.

Energy Intelligence Group:

The Energy Intelligence Group (<http://www.energyintel.com>) is an independent information company that specializes in providing natural gas and petroleum data and analysis. The data is available in database format in daily timesteps and dating back to May 2000. The database contains natural gas spot prices for many major U.S. hubs as well as the Henry Hub natural gas futures contracts prices. Electricity futures contracts data is presented for various hubs in the U.S. (PJM, Palo Verde, Entergy, Cinergy, and COB). Short-term temperature data is also provided in addition to nuclear outage data. Electricity and natural gas spark spread prices are also available. The cost of this historic daily data is estimated at \$1500.

Intelligence Press, Inc.:

The Intelligence Press (<http://www.intelligencepress.com>) offers current and historical natural gas data. The data cover daily spot prices for major hubs across the U.S., a gas price index for comparison, as well as futures market prices. The historical data begin in 1993. It is not clear whether this data is available in database form. Cost information was not readily available for this study.

Platts:

The Platts website (<http://www.platts.com>) offers an abundance of electricity and fuel price data for the U.S. (and worldwide). The POWERdat product is a database developed by Platts designed to aid in power market analysis, including cost-competitiveness, market dynamics, and power trends. Detailed information is provided on power markets, wholesale markets, retail markets, and prices. Data include electricity price information for spot and forward markets. The data include 10 years of historical data. Data is also provided on electricity alerts through an information service that reports transactions and prices in the daily and forward markets. Platts also offers Power Market maps displaying key data such as average wholesale electricity purchases or retail electricity rates for geographical comparison from region to region. Cost information was not readily available for this study.

Power Marketing Association:

The Power Marketing Association (<http://www.powermarketers.com>) is an online resource of up-to-the-minute news stories of interest to power marketers as well as a resource of recent power market data. Available from this website is electricity prices, ISO load/price data, electricity and natural gas futures prices, and spot prices. Data, however, are only available in HTML format for the most recent two days. Cost information was not readily available for this study.

Reuters:

Reuters (<http://www.reuters.com>) offers a number of database products on energy markets. Data provided include spot electricity and natural gas prices as well as swaps, and futures contracts on the NYMEX. Coverage also includes news of supply disruptions, refinery outages and maintenance, natural disasters, weather-related port closures, pipeline operations, and weather data. The Reuters database includes both raw data and derived statistical values to provide more detailed analysis of the market data. Cost information was not readily available for this study.

IV. International ISO-type Market Data Assessment

In this section, data collection and release procedures in various deregulated electricity industries worldwide are described and their attributes discussed.

Most ISO's operate both the system and some markets. Within the scope of these tasks is the maintenance of market data, such as equilibrium prices and quantities transacted.

As in financial markets, traders in electricity industries rely upon timely release of market data to make strategic decisions. Indeed, price signals are necessary to convey market conditions to participants and to deter anti-competitive behavior. On the other hand, the release of some data can potentially deter, rather than aid, the efficient operation of markets. One such example is

disaggregated supply bid data, which if released, essentially reveals the marginal costs of a firm to its competitors. In turn, they can use this information to determine how to price this firm out of the market in subsequent auctions. International comparison of data release practices and analysis of its effect on market performance is an interesting area for future research.

An international survey of data collection efforts in electricity industries reveals which data are collected and the extent to which they are publicly available.

Australia:

The National Electricity Market Management Company, Ltd. (NEMMCO), is a non-profit corporation responsible for the administration and operation of the wholesale national electricity market in accordance with the National Electricity Code. According to its website, www.nemmco.com.au, its objective is "to provide an effective infrastructure for the efficient operation of the wholesale national electricity market." The NEMMCO collects and makes data publicly available on spot market prices and quantities (categorized by dispatch, predispatch, and daily aggregated dispatch settlements), previous day's supply offer curves by generation unit, system forecasts, and ancillary services, to name a few. All data are available for download in a comma-separated values (CSV) format that is compatible with standard spreadsheet programs. Archival data are available from at least one year ago.

Austria:

E-Control, Ltd. (www.e-control.at), is responsible for monitoring, supporting, and regulating the liberalized Austrian electricity market. It gathers market data periodically on generation, consumption, grid asset information, generation asset information, small hydropower plant characteristics, renewable energy information, real-time prices and quantities, and reliability data (e.g., number of blackouts). Publicly available data from the E-Control website include retail rates, grid charges, taxes, generation, and consumption. Most of these portions of the website are still only in German, however. Data on Austrian pool prices and quantities are available from the Energy Exchange Austria (EXAA - www.exaa.at). Hourly prices and quantities are available for the previous six months. These data are, however, only in PDF format. In order to obtain data that can be analyzed, one has to become a member of the EXAA. Hourly bid data (aggregated or otherwise) are also not available in the public section of the website. Some regulation energy prices and quantities are available from the Austrian Power Clearing and Settlement website (APCS - www.apcs.at), but the data are only in PDF format. While the E-Control and EXAA websites have substantial information in English, the APCS website is mostly in German.

New Zealand:

The New Zealand Electricity Market (NZEM) website (located at www.nzelectricity.co.nz) collects wholesale price data for each node and for each half hour via the Commodity Market Information Trading System (COMIT) website (located at www.comitfree.co.nz). The COMIT service is managed by M-Co (www.m-co.co.nz). Final wholesale prices are released to the public at 2PM on the day after the transaction. Directly available at the NZEM website are half-hourly final wholesale prices from 1999 to the present in CSV format. Data from 1996 to 1999 are archived and available upon request. The COMIT website releases bid and offer data from January 2001 to the present in zipped CSV format. These data become available four weeks after the day of transaction. In addition,

COMIT offers historical hydrological data and forecasts. Finally, the system operator, Transpower, releases instantaneous reserve price and quantity data from its website (located at www.transpower.co.nz). Archival price data are available for the previous thirty days, while quantity data are available for the previous week.

NordPool:

In this system composed of Denmark, Finland, Norway, and Sweden, data on generation, consumption, exchange, reservoir, and regulation power are published at www.nordpool.no. These data are available for each of the member states, as well as for the entire NordPool system. Hourly generation, consumption, and exchange data are available for the previous three weeks only. Average weekly reservoir content data (both in absolute terms and as a percentage of the maximum capacity) for Norway and Sweden are available for both the current and the previous year. Those for Finland and the entire NordPool system are available for only the previous year. No such data are currently available for Denmark. Regulation power prices and quantities are available for Norway, Sweden, and Finland for the previous three weeks. A utility on the webpage also allows the data to be displayed in graphs. Prices and quantities for derivatives (such as day- and week-ahead products, forwards, contracts for differences, and block forwards) are also released from the website. These are available for the current day and the previous five days. Hourly spot prices at nine locations (Oslo, Trondheim, Bergen, Tronso, Kristiansand, Sweden, Finland, Denmark East, and Denmark West) are available for the previous three weeks. The hourly volumes traded for the entire system are also available for the previous three weeks. Without exception, all of the data publicly available on the website are in HTML format. No hourly bid data are available in any format. All information is in English.

Norway:

The Norwegian transmission system operator collects and releases data at www.statnett.no. Data are available on power flow, regulating power, production and consumption, imports and exports, and spot market trading capacity. The power flow data consists simply of a map indicating the flow of power to and from Norwegian trading areas. These figures are available for each hour of every month since 1999. The regulating power data are available on an hourly basis for each day of every month since 1999. Production and consumption data, as well as those for imports/exports and spot market trading capacity, are similarly available. All of these data are available in HTML format only. A utility also allows the construction of graphs. Information is readily available in either Norwegian or English.

Spain:

The Compania Operador del Mercado Espanol de Electricidad (OMEL) releases hourly prices and quantities for the primary energy market as well as the imbalance energy market one day after the transactions take place. These are done for both the day-ahead and the intraday markets. In addition, hourly aggregated supply offer and demand bid curves are available, along with commercial capacities of exchanges. Three months after the event, offered and scheduled power by each generator are released. Archival data are available in either HTML, worksheet, or text format. The OMEL website is located at www.omel.es and has a modest English section.

Summary

The deregulation of electricity industries has necessitated arrangements for market data collection and release. A survey of international electricity industries reveals that such data management practices vary from the transparent (in the case of Australia and Spain) to the restrictive (e.g., Austria). The rationale for each extreme case is ostensibly to maintain the efficient and reliable operation of electricity markets by releasing the appropriate amount of information. Yet, of course, no clear rationale for determining the correct level of data release is known and practices vary widely.

V. Genscape Inc. Power 2.1

This section describes the Power 2.1 product marketed by Genscape and the data capabilities available to its customers.

Genscape is a privately-owned company founded in 1999 in Louisville, Kentucky. Since early 2002, Genscape has been marketing the Power 2.1 product, which enables the customer to access in real-time via an internet browser, up-to-date power flow information at various points across the U.S. The Power 2.1 product is being sold largely to power market traders and power plant operators for upwards of \$1 million for a one year subscription. Michael McAuliffe, V.P. of Sales and Marketing with Genscape, provided a rough estimate to the Berkeley Lab in the \$20-30k range for an annual subscription, given the research interest in this proprietary data.

The power flow is monitored through the installation of small monitors at ground level near to high-voltage transmission lines, which remotely transmit power flow data back to a central processing server. According to Michael McAuliffe, the monitors are installed on privately-owned land under a 5-year lease agreement with the landowner. A Logistics team was created to monitor the various monitors and ensure each is properly functioning. The following section of this memo discusses in more detail how the monitors work.

Currently, Genscape monitors 220 different power plants nationwide with a target of 300 by the end of the year. Figure 1 shows how the monitored plants are distributed across the U.S. as well as illustrates the main Graphical User Interface (GUI) supported by this product. Each plant is denoted by a symbol to represent the fuel-type characteristic of the plant – coal, natural gas, hydroelectric, nuclear, oil, and pumped storage. The symbols are color coded to green, yellow or red to denote the percentage of total capacity at which the plant is currently running. Green indicates the power plant is generating at or greater than 80% capacity, yellow translates to between 40% and 80% capacity, and red means the power plant is running at less than 40% of the maximum rated capacity. Also note in Figure 1 the presence of two alerts marked by a red circle around the power plant symbol. These signals represent a significant change (positive or negative) in power plant output. See Figure 15 for more information relating to the Legend of the GUI. In addition to power plants, Power 2.1 also monitors the power flow within some 20-30 transmissions points along with the direction of the flow.

Power 2.1 also displays maps of 10 different regions for closer inspection of the monitoring data. These regions include the East, West, North East, New England, PJM, Cinergy, MidCon, South East, South West and Texas. Detailed power plant data is available by clicking on the plant symbol within the GUI. Additional information includes the plant owner, city and state, NERC ID, output, heatrate,

the control area, the number of different generating units within the plant, alerts to significant plant output changes and a historic 90-day output plot.

The series of figures at the end of this work represent various snapshots of the Power 2.1 GUI obtained during a one-week free trial of the product. The figures represent the national and regional maps containing power plant and transmission line flow data as well as some detailed power plant and transmission point information available for each monitored point. Weather information is also offered regionally and snapshots are shown in Figures 13 and 14.

Archived data is also available for certain monitoring stations going back as far as spring 2001, depending on when the station started being monitored.

The text in the next section offers detailed information regarding the monitor technology that was provided by Genscape.

Detailed Information on the Monitor (provided by Genscape)

Each of the over 1,000 Genscape monitors on-the-ground around the U.S. consists of the following components:

- PVC pipe.
- Electric and magnetic field sensors.
- 12-volt battery that powers the monitor.
- Solar panel that recharges the battery by day.
- A microburst cellular data modem.

Remote Transmission Unit (RTU) firmware in the monitor wakes up every 60-seconds and measures the electric and magnetic fields emanating from every line attached to a monitored facility. The RTU sends five variables to the Genscape database:

- Horizontal angle (magnitude and direction).
- Vertical angle (magnitude and direction).
- Phase angle, which is the sum of the horizontal and vertical angles, which determine power flow.
- Electric field, which is helpful in correcting for precipitation, angle fluctuations, temperature (line sag).
- Magnetic field.

Once the DB sees collects all of the five measured variables from all monitors (lines) at a plant, Genscape applies a science code our own construction that calculates the power on each line based on the shape and strength of the magnetic field that each RTU reports. We are also able to estimate the direction of power flow on each line based on field shape characteristics. The math in the code then adds up the individual MWs from all lines to get a plant total, which we report to our clients via the Genscape Power System (web product interface) and also through our direct ('raw') data feed. The time span from when the data hits the DB to when a user sees it in the GUI averages less than two-minutes.

The RTU reports data at the top and bottom of every hour regardless of what's happening on the line, sending the information via a cellular data call to the Genscape database. However, meaningful deviations in plant output or intertie flow beyond defined parameters are reported as they are observed, or, up to every 1-3 minutes. The sensitivity of a monitor is based in part on the prime mover and fuel type at the plant that is being monitored and every plant has its own set of alert parameters. Thus, "significant events" are defined differently at a nuclear facility versus a gas or oil fired plant.

Maintaining and growing the network

Genscape has invested several million dollars to deploy the current monitoring network and maintain it on an ongoing basis. We continue to invest in its expansion based on the monitoring needs and requests of our growing client base. Genscape employs eight full-time people in our Logistics Group whose sole mission is to survey plants, procure easements from private property owners and install new monitors as well as service existing ones.

Unless a monitor gets physically knocked over or hit by lightening, it will always be feeding data, though conditions can occur that cause Genscape to suspect the quality of the information coming from a monitor. It is rare, though "e-field decay" can come about because the monitor sensors are highly sensitive. E-field decay can take place when (for example):

- Vegetation (wheat, corn, weeds, tree branches) grow up immediately around the monitor
- Insects (ants) get up inside the sensors and foul circuit boards
- Livestock interrupt the operation of the unit
- Floods, fires, winds occur

If any condition causes Genscape to suspect that data emanating from a monitor or set of monitors at a facility, Logistics personnel are immediately dispatched to conduct site surveys and correct any problems. We also flag the plant or transmission point icon in our Genscape Power user interface indicating to the client that there are written notes attached to that plant and that monitor maintenance may be pending.

Genscape Power 2.1 - Microsoft Internet Explorer

NRC Report Update: 10/16/02 05:38 AM

Last updated plant: McKingm River
10/16/02 11:33 EST

REGIONS REPORTS LEGEND WEATHER SETTINGS HELP

National

Plant Name:	Valley
Plant Owners:	TXU Generation Co., LLC
Plant Type:	Gas
City:	SABOY
State:	TX
NERC ID:	3338
Last Updated:	10/16/02 11:29
Output (MW):	18
Capacity (MW):	1116

ALERTS

scroll ⏮ ⏭

- 10/16/02 11:30: Montour reported: Output fell below 400 mw to 473 mw
- 10/16/02 11:29: Antelope Valley reported: Output rose above 450 MW.
- 10/16/02 08:52: Homer City reported: Output fell below 750 mw to 1655 mw
- 10/16/02 08:57: Edson Hatch reported: Output rose above 1200 MW.
- 10/16/02 08:57: Merom reported: Output fell by 245 mw/-42% over 150 minutes
- 10/16/02 04:52: Free Stone reported: Output fell below 400 mw to 274 mw
- 10/16/02 01:57: Laramie River Station 1

HEADLINES

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- NYMEX crude slips to backwardation from contango
- Brazil oil rig straightened
- Euron's reign of terror lives on
- The Power Plant Blow
- Cell Network renders Forum operational centers more efficient

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Connected To Server: [Icon]

Figure 2. The EAST region

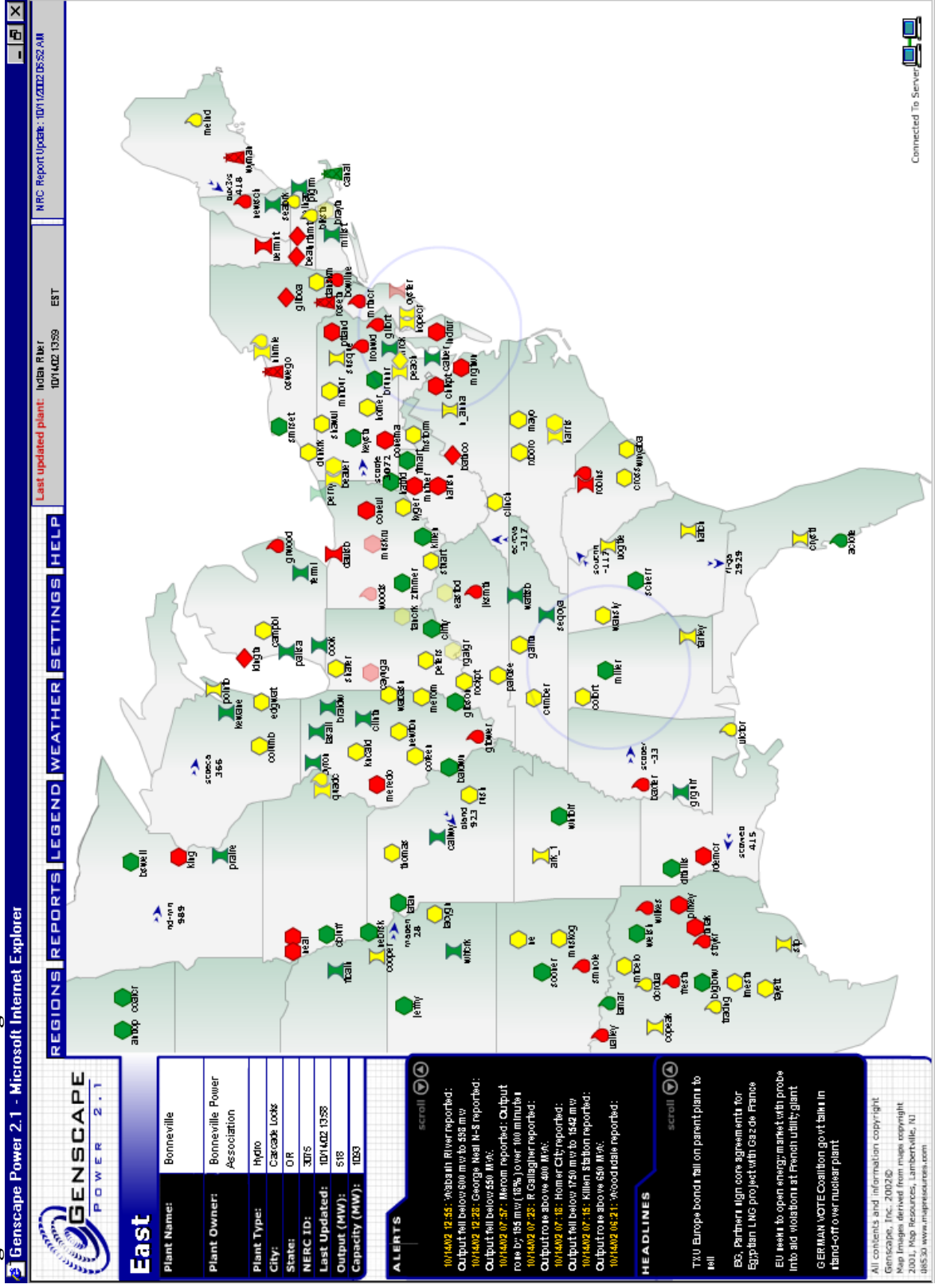


Figure 3. The WEST Region

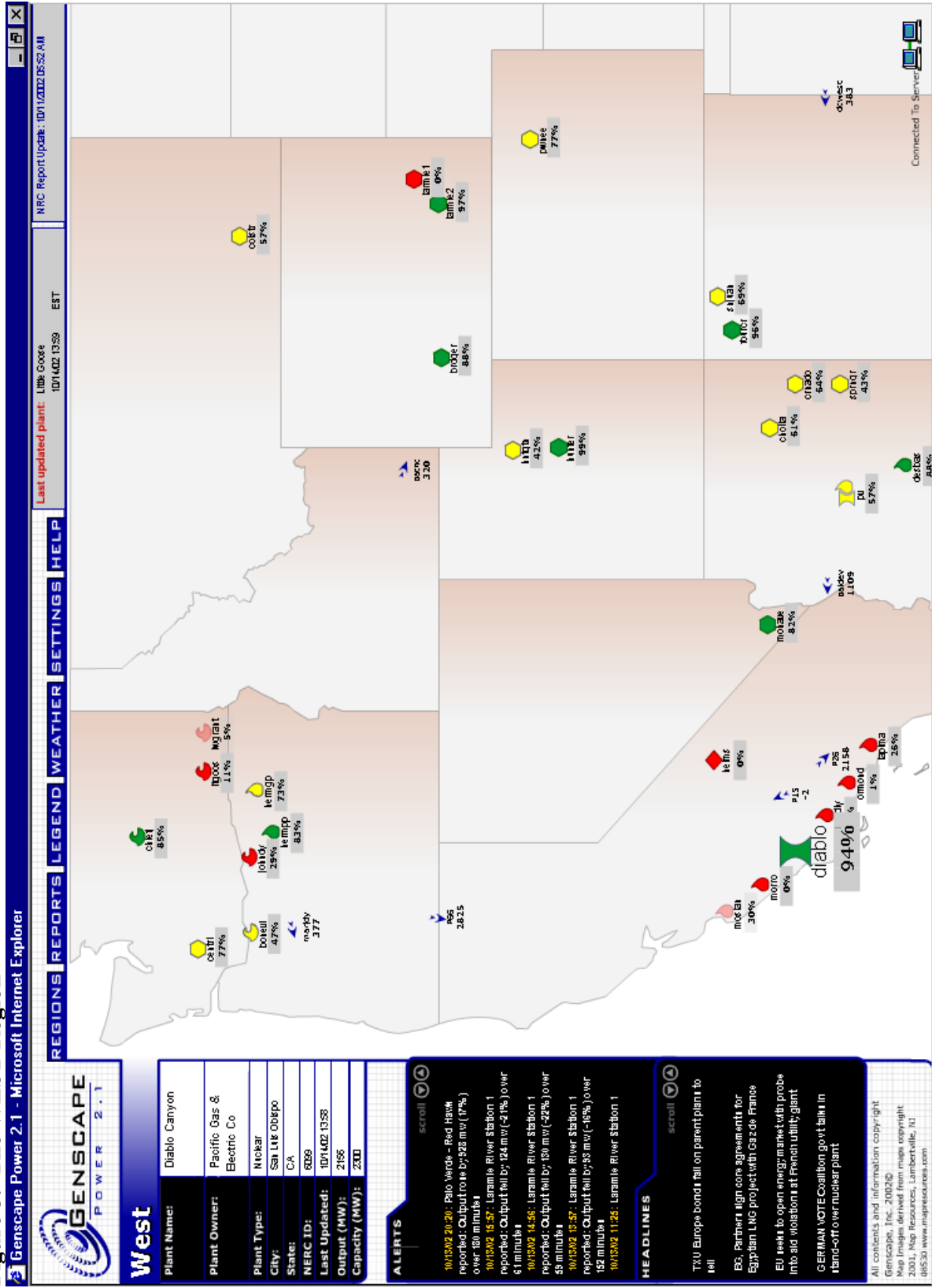


Figure 4. Transmission Line Path 15 in California

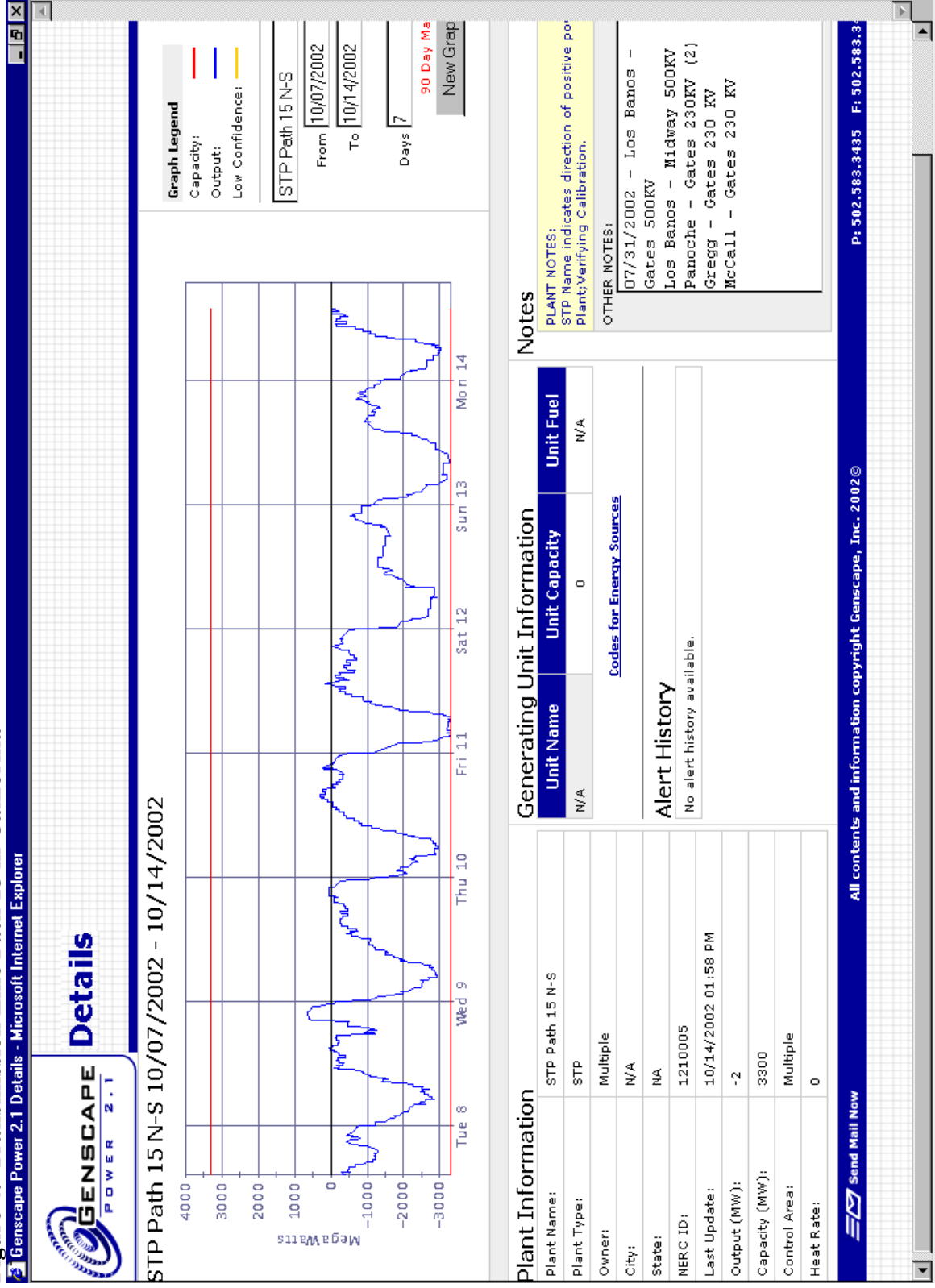
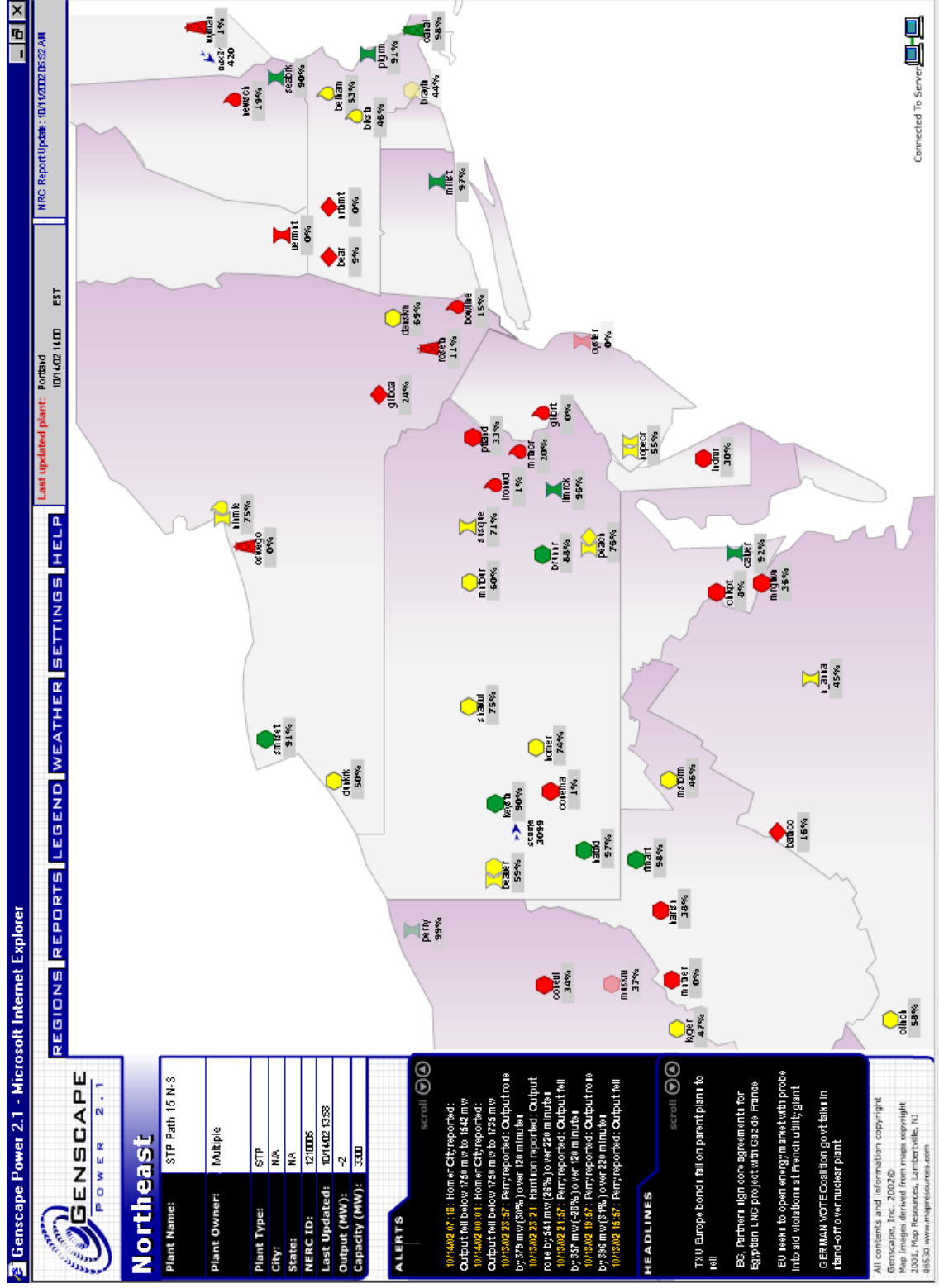


Figure 5. The NORTH EAST Region



Genscape Power 2.1 - Microsoft Internet Explorer

NERC Report Update: 10/14/02 05:52 AM

Last updated plant: Bk lka m G lloca
10/14/02 14:01 EST

REGIONS REPORTS LEGEND WEATHER SETTINGS HELP

New England

Plant Name:	Canal
Plant Owner:	Southern Energy New England,
Plant Type:	Oil
City:	Savonick
State:	MA
NERC ID:	1559
Last Updated:	10/14/02 14:01
Output (MW):	1136
Capacity (MW):	1165

ALERTS

10/15/02 00:00: Denhammer reported:
Output fell below 200 mw for 151 mw
10/15/02 05:32: Limerick reported: Output
rose by 455 mw (25%) over 200 minutes
10/15/02 05:00: Gilbert reported: Output
rose above 475 mw to 492 mw
10/15/02 05:00: Seabrook reported: Output
rose by 275 mw (22%) over 200 minutes
10/15/02 05:34: Surqueinanna reported:
Output rose by 474 mw (26%) over 200
minutes
10/15/02 04:35: Surqueinanna reported:
Output fell by 525 mw (-42%) over 75
minutes

HEADLINES

TXU Europe bonds fall on parent plans to
sell
B3, Pichon sign core agreements for
Egyptian line project with Gaz de France
EU seem to open energy market with probe
into aid violations at French utility giant
GERMAN VOTE Coalition govt bids in
stand-off over nuclear plant

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The map displays the New England region with various power plants marked by colored icons and labeled with their names and current output percentages. The plants include:

- mchd: 53%
- wmba: 1%
- bacoia: 4.2%
- canal: 98%
- pjm: 51%
- belam: 53%
- bkb: 46%
- braha: 44%
- millet: 97%
- glloca: 23%
- dazim: 58%
- boillie: 15%
- rogeth: 11%
- oswego: 0%
- link: 74%
- plead: 33%
- indoor: 20%
- glbt: 6%
- ilook: 95%
- pscl: 78%
- stelo: 71%
- ilook: 1%
- ilook: 95%
- pscl: 78%
- ogert: 0%
- urmt: 0%
- dear: 9%
- urmt: 0%
- zackm: 89%
- zackm: 89%

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Figure 7. The PJM Region

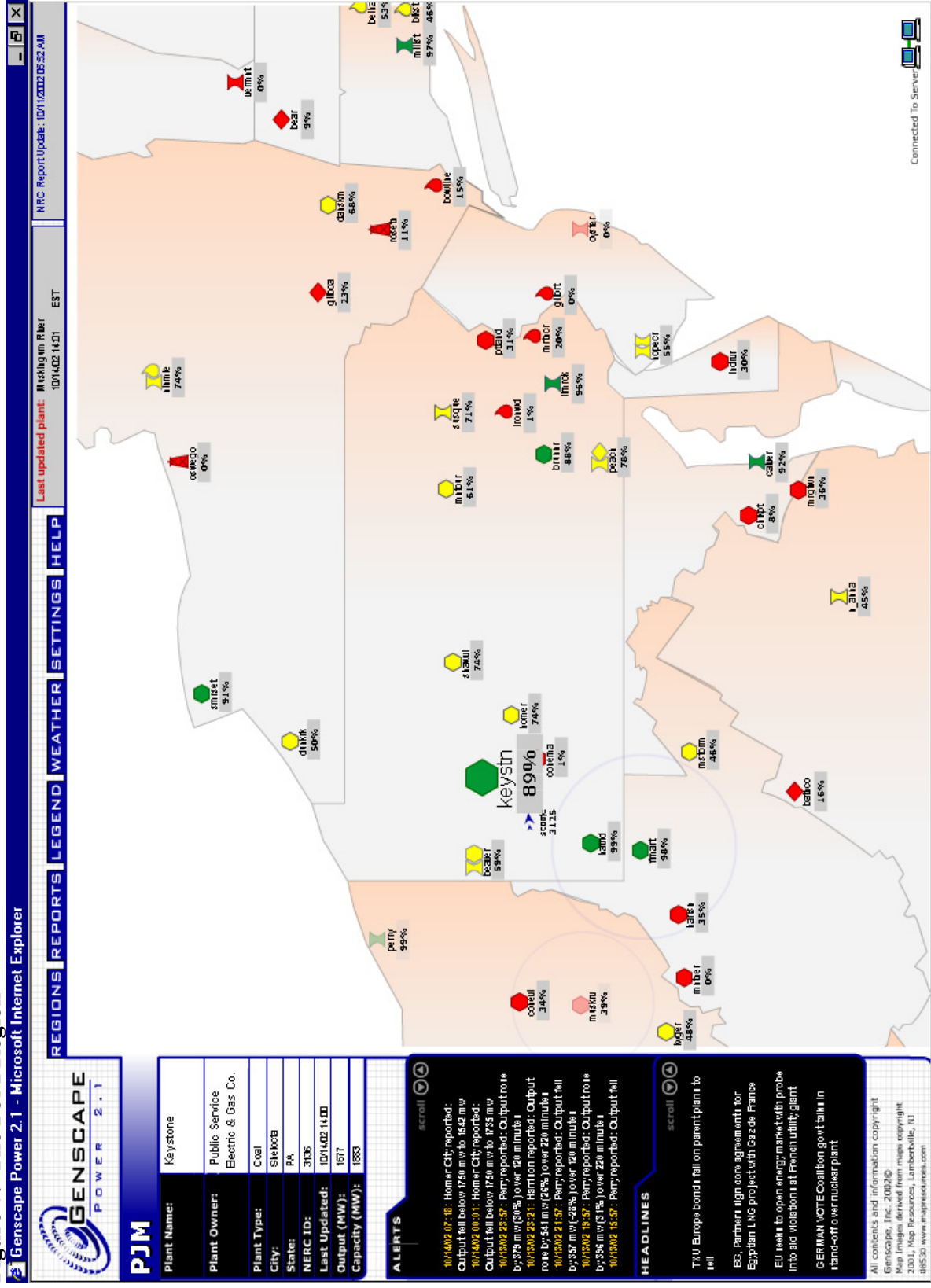


Figure 8. Hartford Ferry Coal Plant in the PJM Region (90-Day maximum history)

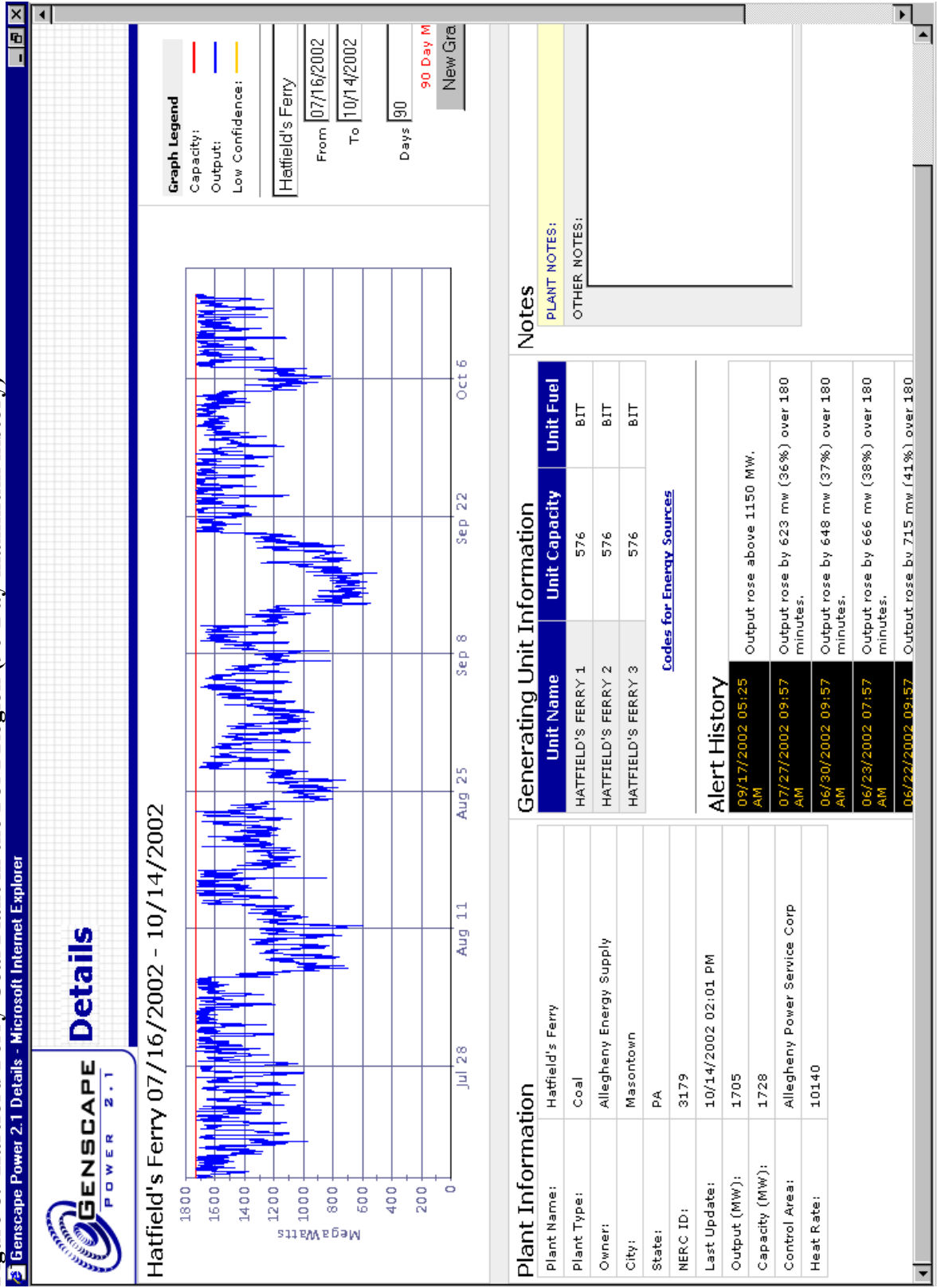


Figure 9. The CINERGY Region

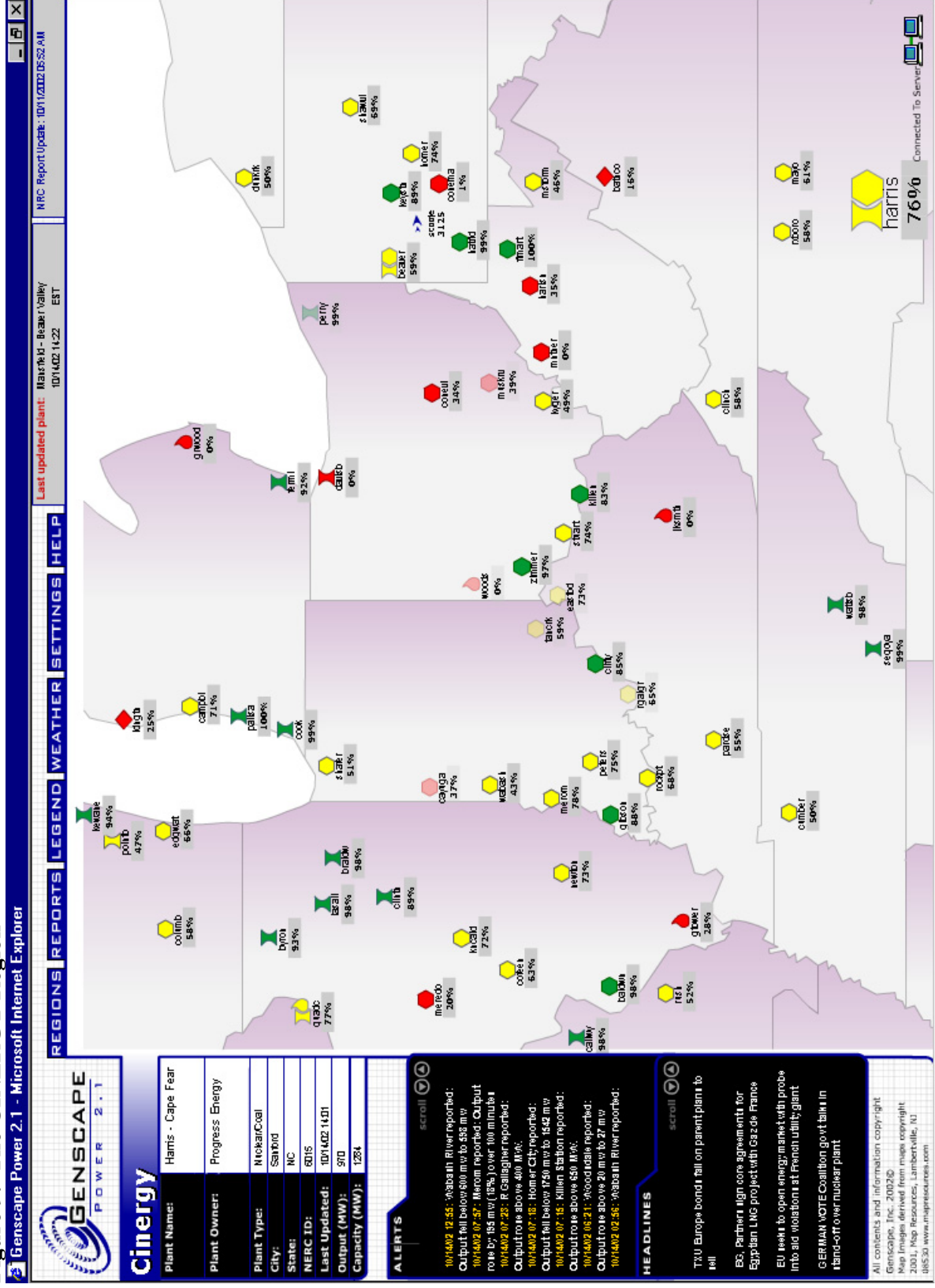


Figure 10. The MID CON Region

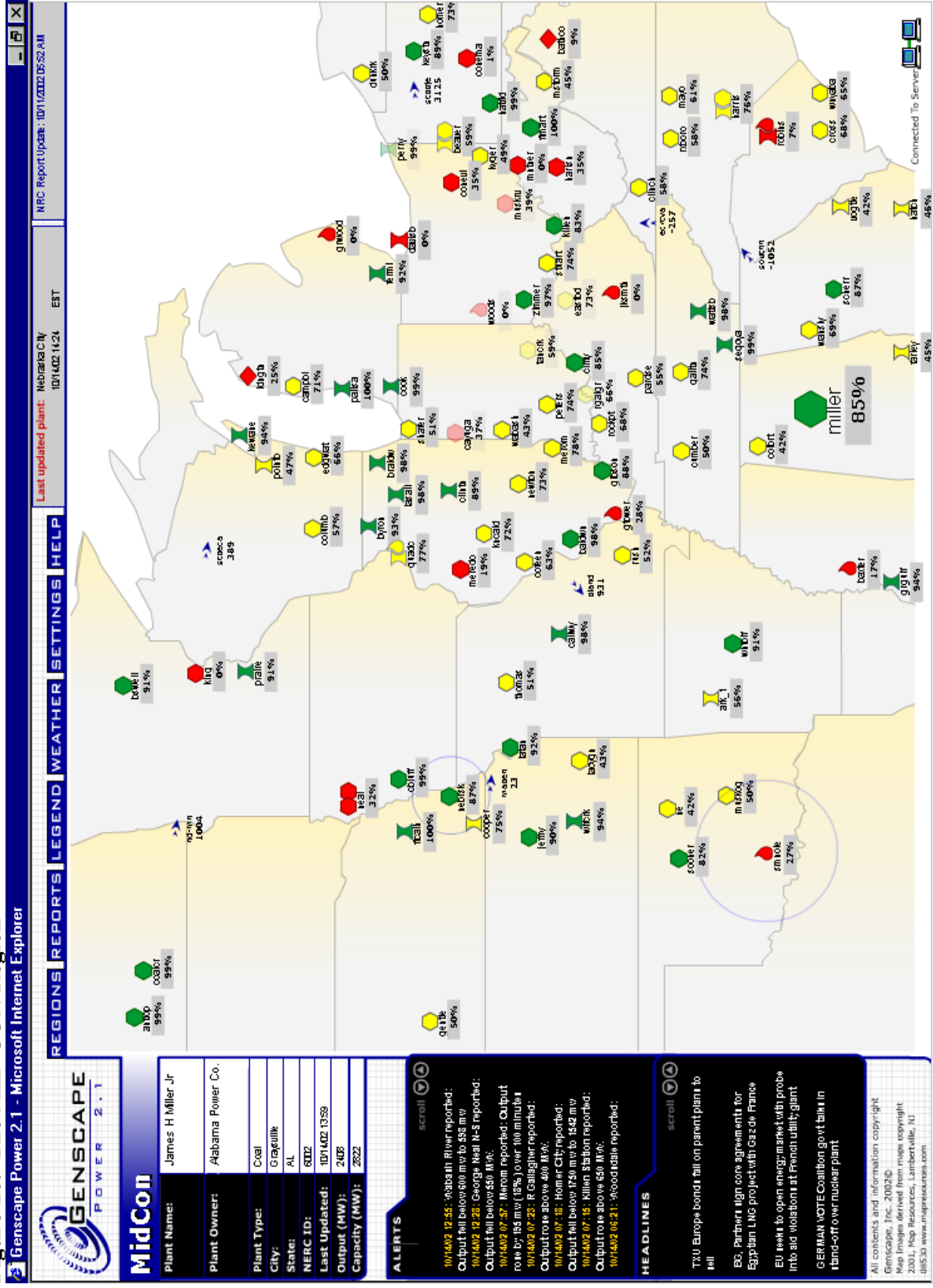
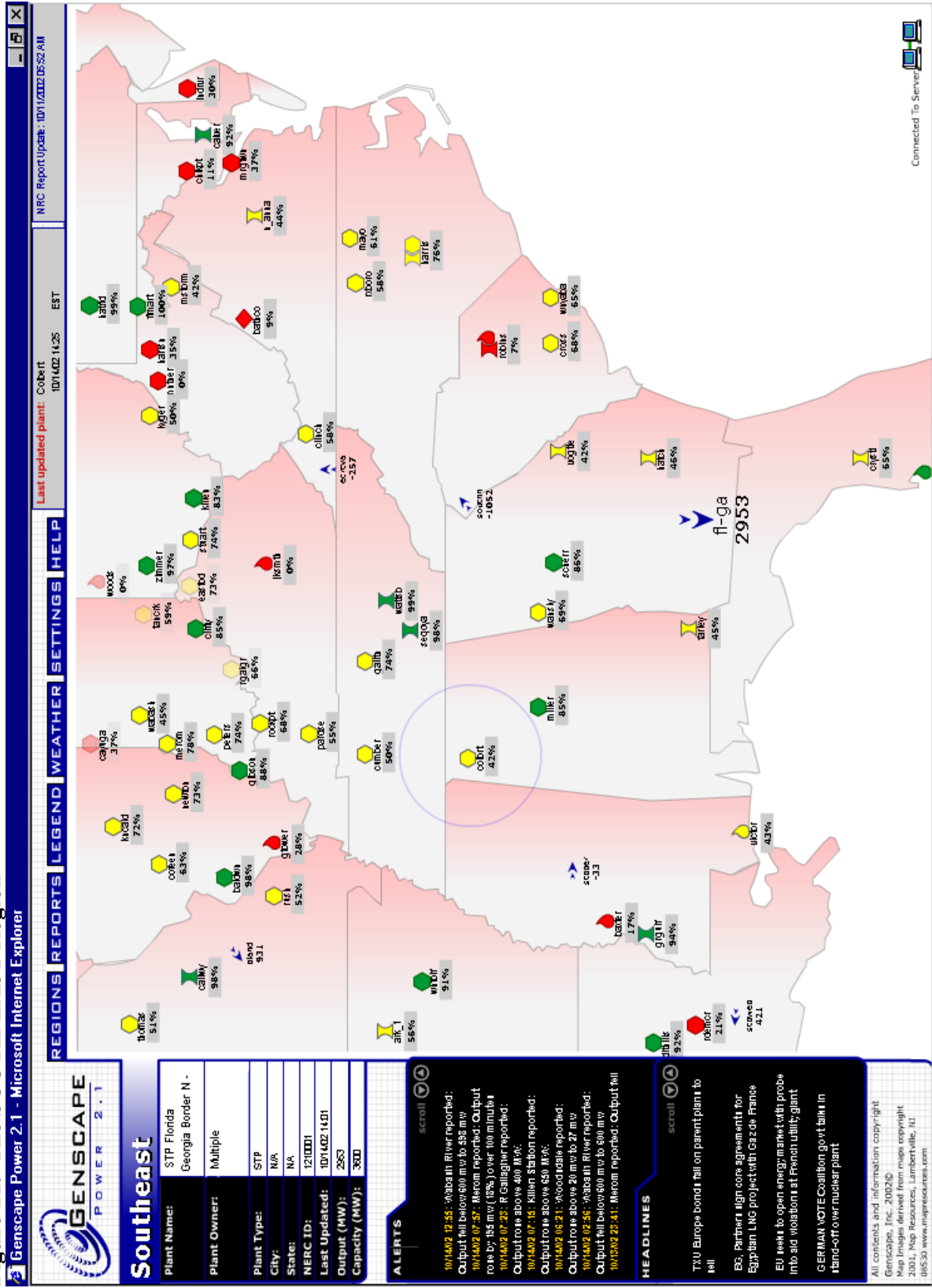


Figure 11. The SOUTH EAST Region



[illegible]

Figure 13. The WEATHER

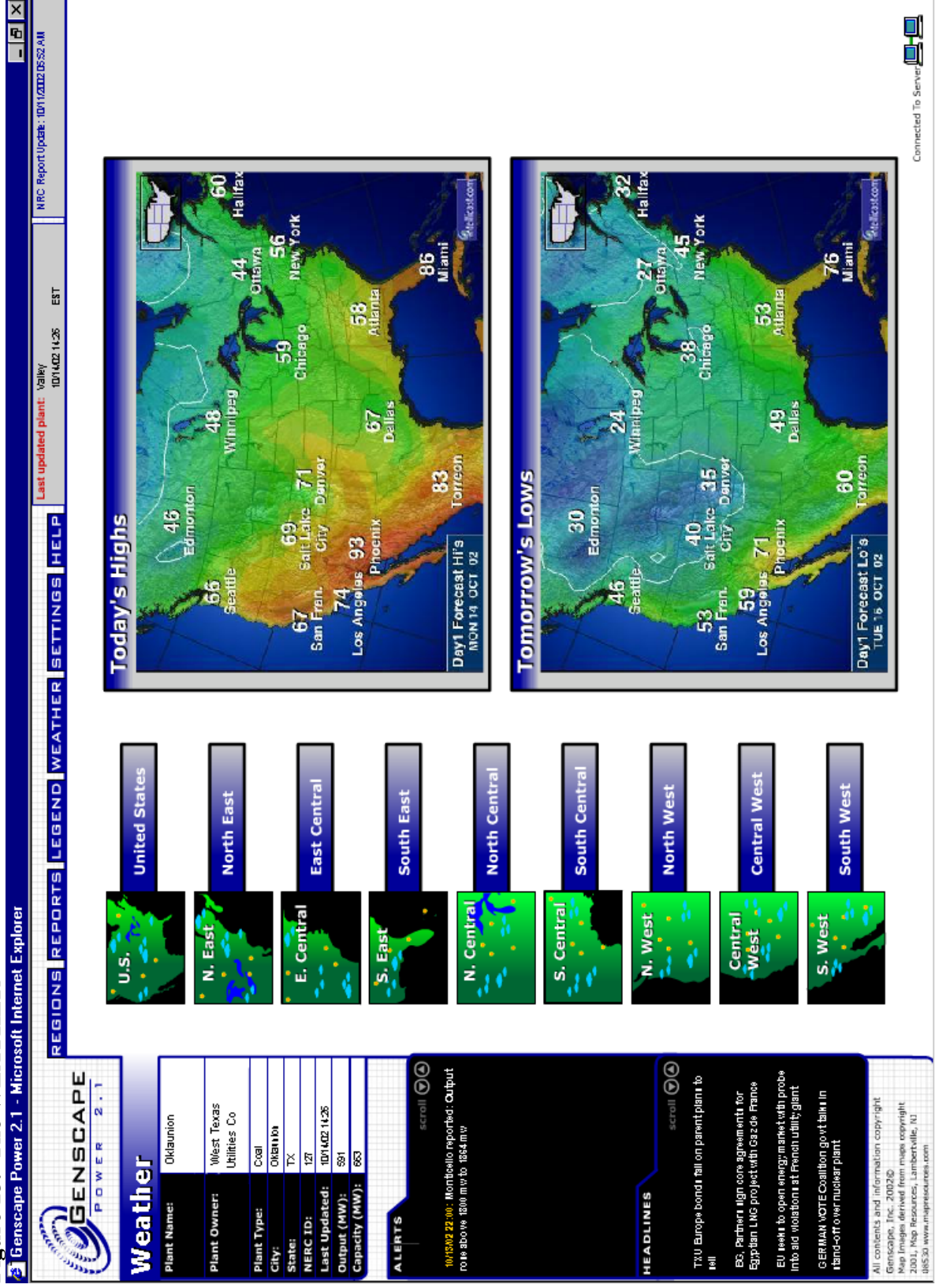


Figure 14. The NORTH WEST WEATHER

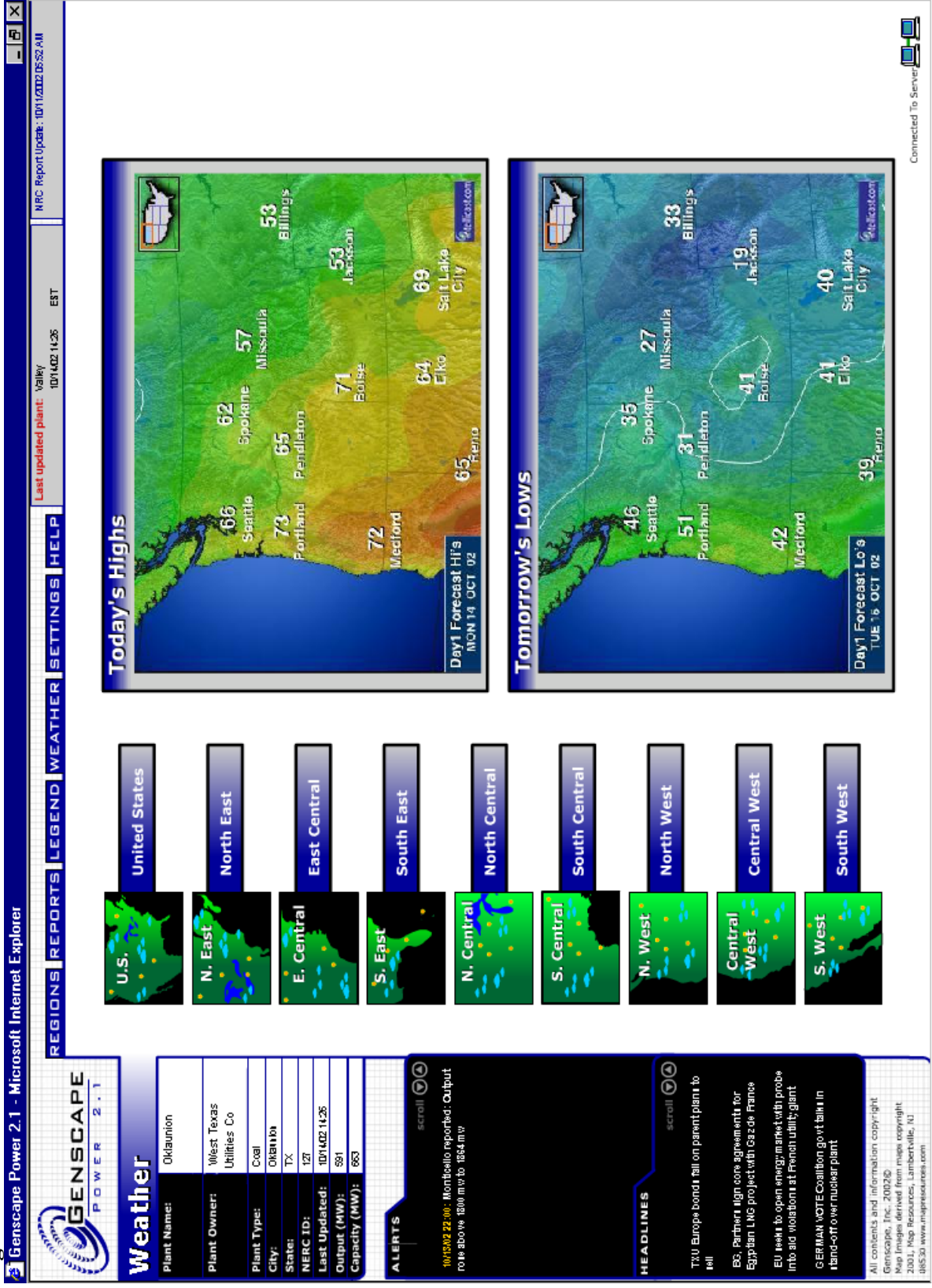


Figure 15. The LEGEND

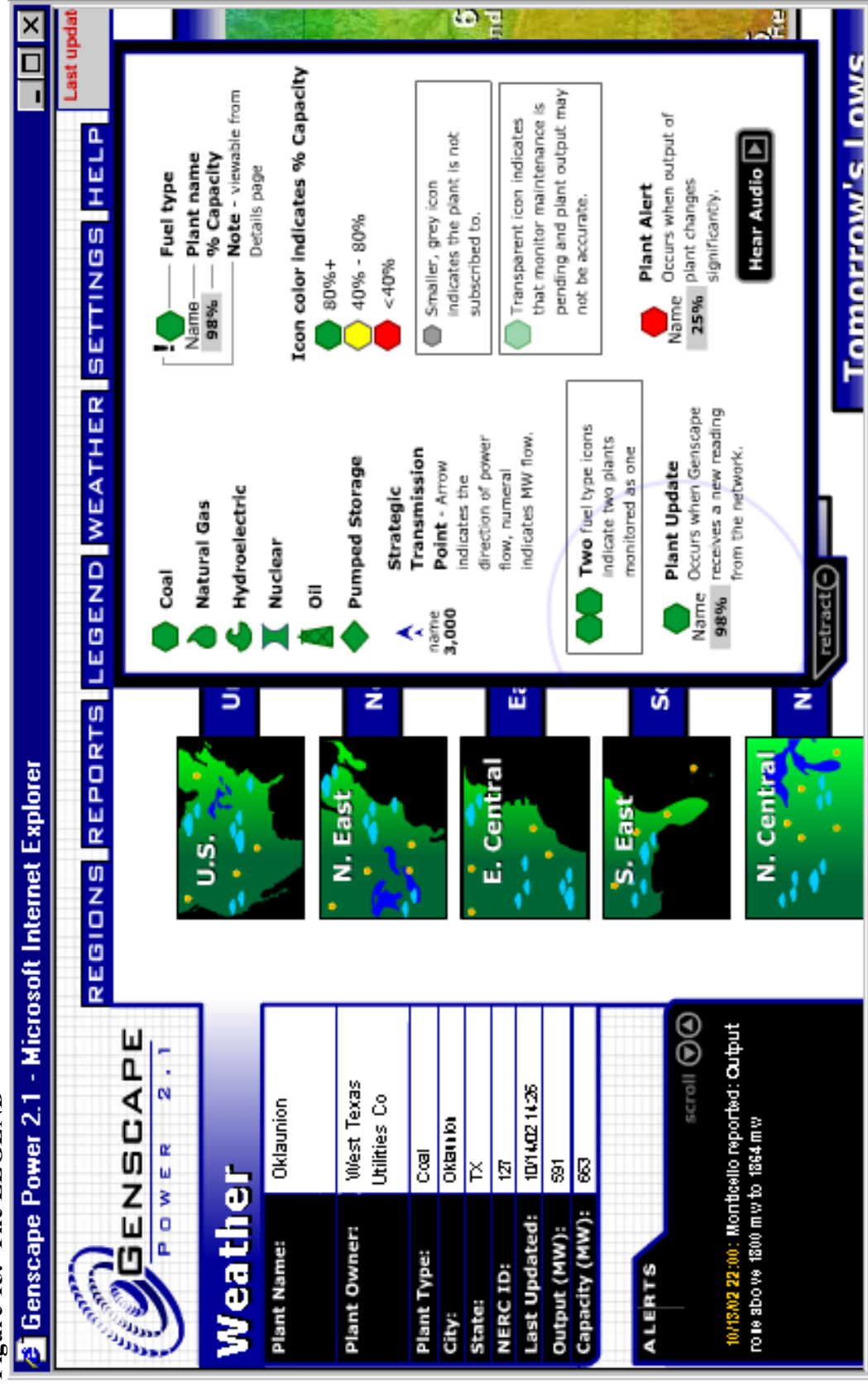


Figure 16. The Mandalay Gas Plant in California

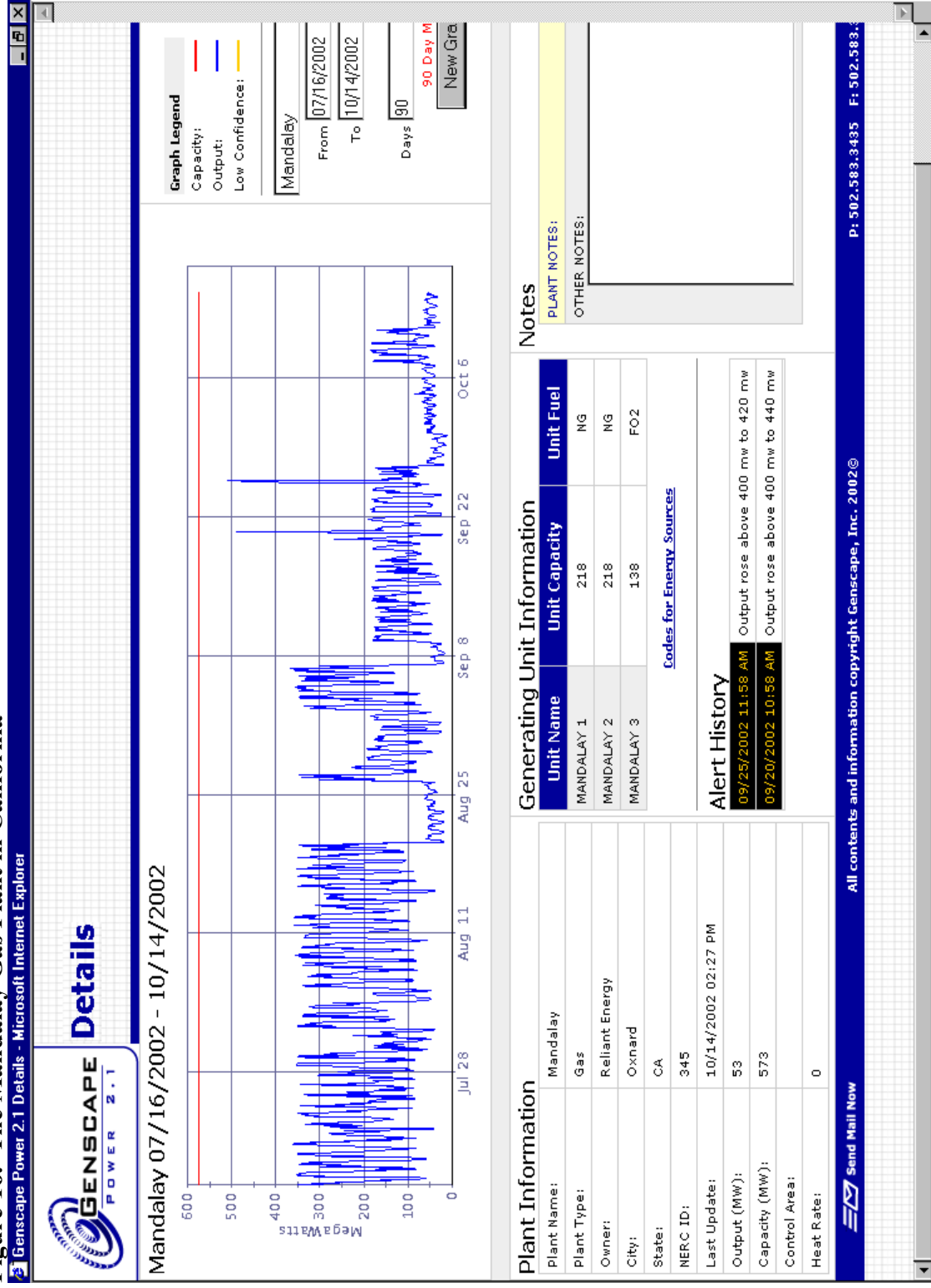
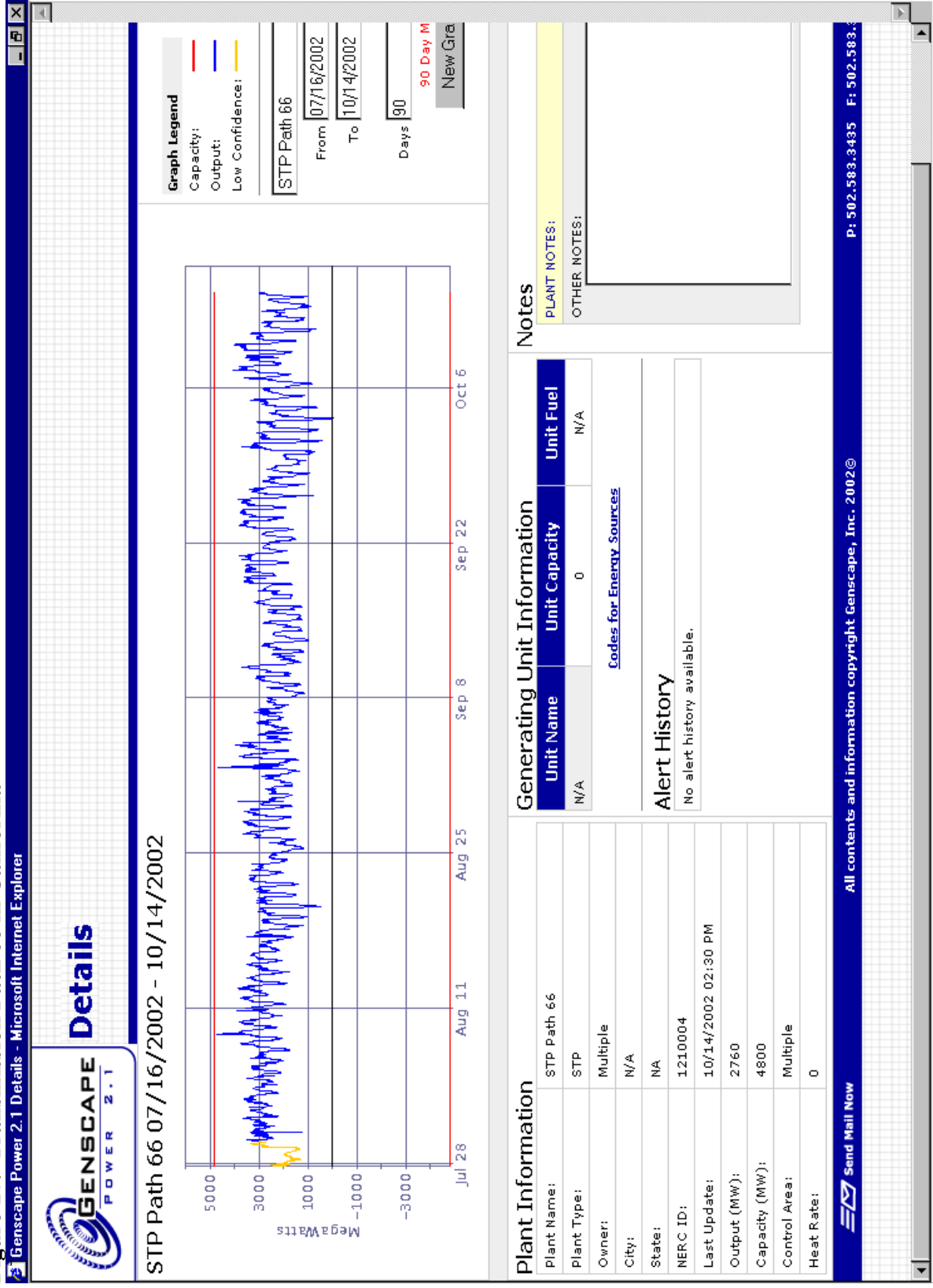


Figure 17. Transmission Path 66 in California



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Figure 18. Power 2.1 Monitoring Device

